Putting time first

Theorizing how digital technology influences the pace of work

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Abstract

Organizations often adopt, implement and use digital technologies to speed up work and save time. However, the relationship between time and technology is complex and organizations do not always realize the acceleration potential of a technology, nor do they achieve the timesavings that designers intended the technology to bring about. In fact, many organizations and organizational actors feel more pressed for time than ever before despite the use of a multitude of digital technologies. To account for this, we draw on literature about the concept of time and time-driven change combined with theory about acceleration and deceleration mechanisms to develop a nuanced vocabulary and conceptual framework, consisting of eight parameters, for understanding how digital technology influences the pace of work, in general and in a particular organization. Key insights are that digital technologies are more likely to increase the pace of work than to save time and free up human resources. Yet, due to unintended consequences of acceleration as well as natural and intended limits to speed, digital technologies might speed up some aspects of work, while decreasing others and/or have little overall effect.

Introduction

Time is a key concept in organization studies, especially for process research that, e.g., looks at retrospective sensemaking (Weick, 1995), organizational becoming (Hernes, 2014) and narrative structuring of events in time (Boje, 2001; Czarniawska, 1997) as well as for studies of how organizational actors spent their time at work (González & Mark, 2004). Also in practice, time is of the essence. Much organizational activity is structured around clock time (e.g., meetings), calendar time (e.g., deadlines) and events in time (e.g., major and minor organizational changes). Thus, time and temporality are central concepts for understanding organizational phenomena (Ancona et al., 2001), and particularly for understanding the pace and pacing of work in organizations.

It has been pointed out that we live in a high-speed society (Rosa, 2010), where faster is better, where organizational actors are both encouraged and inclined to squeeze more and more activity into their workday, and where new products, services and technologies emerge at rapid speed. All of which might lead to increased organizational value creation and individual efficiency as well as employee exhaustion and a collective experience of time famine (Perlow, 1999; Rosa, 2010).

To keep up with the fast pace of society, organizations increasingly depend on digital technologies, *from* by now well-known applications and platforms, such as pervasive internet access, email, office software, ERP systems, social media, videoconferencing and online collaborative tools *to* technology that is just on the verge of becoming mainstream, e.g., big data, internet of things and artificial intelligence. As new technologies emerge and, gradually or rapidly, transition from new to mainstream, it can be a challenge for organizations to understand the technologies' positive and negative consequences, whether to adopt or not, and how to ensure that the potential of the technology is realized.

Organizations adopt, implement and use digital technologies for a variety of reasons. Chief among those are to save time and speed up work, e.g., by reducing the need for transportation of people and goods, developing and delivering more products and services faster, and increasing the amount of information and communication messages that can be processed. However, the relationship between technology and time is complex. Organizations do not always harvest the intended timesavings, nor do they necessarily realize the acceleration potential of a technology. Moreover, research points out that organizations use the same technology very differently, and they therefore benefit differently from even highly standardized technologies (Majchrzak & Markus, 2012).

In this paper, we propose that whether or not digital technology accelerates work in the desired way in a given organization might have as much to do with the organization's values, norms and practices

regarding the use of time, as it has to do with the actual functionality of the particular technology. This indicates that organizations often have to make a conscious and proactive change in the temporal structuring of work to leverage the timesavings and increased pace that they are hoping to achieve; as the potential of the digital technology might otherwise be overruled by the organization's established time practices.

It can of course also be debated if faster is always positive, especially for the individual organizational actor. On the one hand, the archetypical image of the constantly available, online, deadline plagued knowledge worker comes to mind; representing a way of working that can cause rigid thinking, create resistance to change and in fact, lead to deceleration of the pace of work (Wajcman, 2015). On the other hand, studies show that time flies and that people perform well when they are absorbed in activities that they enjoy and find meaningful (Csikszentmihalyi, 1997*)*. This suggests that it is relevant to take the subjective experience of time into account if organizations wish to accelerate the pace of work without counter-productive effects.

In this paper, we set out to develop (1) a nuanced vocabulary for understanding how digital technologies influence the pace of work and (2) a conceptual framework, which researchers and organizations can use to inquire and intervene into the temporal structure of work practices to realize the potential of a particular digital technology in a given context.

Theoretical background

In this section, we outline the understanding of time and time-driven change that serves as the theoretical backdrop for the remainder of the paper. First, we present an argument for the choice of time as our theoretical lens; then, we define the concept of time and lastly, we summarize how we build on and extend extant research about time and change in organizations.

Time constitutes a relevant theoretical lens for theorizing about organizational phenomena for a number of reasons. Firstly, because all organizational activity - including everyday work, major and minor adjustments to work practices, as well as planned and emergent change - unfold in time (Weick and Quinn). Second, time cuts through all other spheres, including the political, cultural and social dimensions of organizational life, as well as through all levels of analysis, i.e., organization, team, individual and activity level (Rosa, 2013). Third, time and temporality are inherent to the way organizational actors think, talk, act and partake in organizational life. This manifests itself in that the socially constructed, culturally taken for granted time practices that are dominant in a given organization, e.g. clock, calendar, work hours, fixed meetings (i.e. daily, weekly, monthly, annually),

holidays, short-term or long-term horizon, are encountered by its members as normative expectations, which they conduct their behavior and plan their (work) lives arounds (Rosa, 2013). This provides organizational stability. This in turn means that the dominant time structures are difficult to change, but also that if they do change they can fundamentally alter the nature and meaning of work.

At the same time, the individual organizational actor constantly juggle different, coexisting temporalities in order to plan and go about their individual (work) lives as well as to coordinate and synchronize their activities with others (Wajcman, 2015). Analytically, this juggling can be said to cover different time schemes, such as the past, present and future; work, home life and leisure time as well as different types of temporality for different types of activities. Practically, these time schemes interweave and constitute the backdrop against which life is conducted. As when an organizational actor, e.g., spend half an hour planning a meeting (interrupted by a phone call from a family member concerning their evening plans), while considering how long the meeting should last and how the meeting should be structured to facilitate the participants' reflections on the organization's three year strategic plan. The need and digitally supported ability to manage multiple temporalities helps explain the modern experience of (work) life as flux, characterized by interruptions and fragmented use of time.

In line with this, time as a concept can be viewed, researched and experienced as objective time, subjective time and collective time. *Objective* time refers to time as something that exists outside the human mind (Bunnag, 2017), e.g., dates, clock time, and the measurable duration of time. This is the currency of the workplace and employees literally sell their time for money. This also means that objective time is the easiest to focus on and we speculate that when organizations introduce new digital technologies they are primarily concerned with the technologies' benefits in objective time. However, objective time is also a relatively narrow conceptualization of time. *Subjective* time refers to time as individually experienced and mind-dependent (Bunnag, 2017). Thus, subjectively, time can be: a resource to be used, managed and even optimized; an experience of time that flows, e.g., fast or slow depending on the activity; as well as a way of being in the world; that is, as humans we are always right here right now in the present (Heidegger, 1927 [2010]), also when planning the future. This allows for a more nuanced understanding of time, including the organizational actor's ability to and need for juggling multiple temporalities as well as the fact that different types of work might be experienced quite differently and might require different levels of present-ness. It has, e.g., been suggested that service and care work often require a quite high level of present-ness, both in objective and subjective time, because of the need to relate to the other (Rosa, 2013). Lastly, time is

a *collective* accomplishment in all areas of life, including in organizational settings where intentional goal-oriented activities require that multiple (collocated and distributed) organizational actors coordinate and synchronize their activities in objective time on an ongoing basis, among other things facilitated by the organization's socially dominant time schemes.

Orlikowski & Yates (2002) suggest that these different notions of time can be addressed by adopting a practice-based perspective, as time – and different types of time, e.g. 'coffee time', which has a duration in time, constitutes a subjective experience and perhaps a collective norm in the workplace - is realized through the practices of organizational actors. Thus, organizational actors experience and practice time depending on the meaning and values they ascribe to different types of activities. Therefore, Staudenmayer et al. (2002) also argue that changing the temporal structuring of work practices is a powerful driver of change, both symbolically and literally, and that it is by using time in novel and creative ways that major change can be achieved.

In this paper, we build on the abovementioned notions to look at time as a driver of digitally-enabled change of work practices. Moreover, we extend existing understandings by developing a nuanced vocabulary that focusses on both the acceleration and deceleration potential of digital technologies. To this end, we draw on Hartmut Rosa's theory about the acceleration of society and modern life. To our knowledge, this theory has not previously been used to theorize how digital technologies influence the pace of work in organizations.

A critical theory about the acceleration of modern life

The sociologist Hartmut Rosa (Rosa, 2010; 2013) looks at the temporal structure of society from the perspective of critical theory. He identifies three categories of change in the tempo of modern life: (1) technological acceleration, evident in transportation, communication, and production; (2) the acceleration of social change, reflected in cultural knowledge, social institutions, and personal relationships; and (3) acceleration in the pace of life, which happens despite the expectation that technological change should increase an individual's free time. Due to the combination of technological acceleration and the increasing pace of life, the subjective experience is that time seems to flow ever faster, leading to time scarcity, which in turn demands even faster lives, supported by even faster technologies.

In this paper, we make a reading of Rosa's theoretical ideas as they pertain to an organization context and the digitalization of work. We particularly build on the following three main points: (1) there is a clear paradox between digital technology and the pace of work, because digital technologies are

developed and used to reduce the time needed to perform certain activities, which should decrease the pace of work. However, rather than time becoming abundant organizational actors increasingly feel pressed for time. (2) A nuanced understanding of acceleration is needed, because while many aspects of work are indeed accelerating due to the use of digital technologies, other aspects may not be and could even be decelerating. (3) There is no temporal logic inherent in digital technologies and a particular type of technology can have contradictory effects - accelerating certain aspects of work, while decelerating others - depending on how the organizational actors, deliberately or not, happen to use them. Thus, the argument in this paper is that how digital technologies are put to use should be carefully considered.

Acceleration and deceleration mechanisms

In this section, we outline a number of ways in which digital technology can accelerate and decelerate the pace of work as well as how an increase or decrease in the speed of work might affect the subjective experience of the individual organizational actor.

Acceleration of the pace of work

There are four ways in which digital technologies can escalate the speed of work in objective time, namely by making it possible to (1) perform activities faster, (2) reduce or eliminate breaks in the flow of activity, (3) perform several activities simultaneously (e.g., because the individual actor engages in multitasking or through coordinated effort by multiple actors) and (4) to replace slow, temporally costly activities with faster ones (e.g., by automating work or introducing artificial intelligence). For the individual organizational actor, an acceleration of the pace of work in objective time can give rise to the subjective phenomena of stress, hecticness and lack of time, because the amount of time in which the organizational actor can concentrate exclusively on one activity becomes shorter and shorter. However, an increased tempo of work can also make the actor experience a sense of accomplishment, self-efficacy and social recognition.

In addition to these, there are a number of less obvious ways in which digital technologies accelerate the pace of work. First, even though digital technology does not force a heightening of the pace of work by itself, it often changes the temporal norms that underlie organizational action and plans. For example, in many workplaces the norm is that email (despite being an asynchron technology) should be answered almost immediately and if that is not possible, there should be an autoreply that informs the sender when a reply can be expected. Thus, in many cases, it is not just that digital technologies

make it possible to perform activities faster. They also lead to activities being undertaken more frequently. Especially with regard to Information and Communication Technologies (ICT's), increased collective expectations regarding availability and responds times account for much of the perceived urgency to accomplish tasks that organizational actors experience on an ongoing basis (Rosa, 2013; Wajcman, 2015).

Second, when time is freed up from one activity, it is often quickly substituted with other activities or with expectations regarding increased and/or improved output. This means that the experience for the organizational actor can be one of increased pace of work despite technology-induced timesavings.

Another explanation for the quickening of the pace of work can be found in a specific side effect of new digital technologies, namely the opening up of new fields and new possibilities of action. This can for example be in the form of new products and services, new business models, digitalization of previously material products and processes, and data processing and transmission in (near-)real-time. However, taking advantage of these opportunities can require substantial time resources, thereby making the organizational actors busier, even though the technology does initially free up time in the expected areas.

Rosa argues that objective increases in the speed of activities due to digital technologies of course contribute to a heighten pace of work. However, it is the shift in collective expectations and norms (i.e. more output or responses, more often and with better quality) as well as the multiplications of new exploration-requiring opportunities that are among the main causes of the acceleration of the pace of work and the rise in the subjective experience of time pressure. This suggests that digital technologies are more likely to increase the pace of work, for the abovementioned reasons, than to save time and free up human resources; also when reduction in the need for human labor is the explicit intend of both designers and adopting organizations.

Deceleration of the pace of work

The abovementioned acceleration mechanisms seems to suggest that digital technologies more or less automatically leads to acceleration in the pace of work. Yet, literature about IT benefits realization (Ward & Daniel, 2012; Ward et al., 1996) and implementation challenges (Hauder et al., 2013; Greenhalgh et al., 2017) suggest otherwise. To account for this, we now look at deceleration mechanisms.

Firstly, there are natural limits to the pace of work due to human characteristics and calendar and clock time. Thus, (as of yet) human physicality constitutes a barrier for acceleration due to the speed limits of the brain (e.g. perception, stimulus processes and reaction times) and of the body (e.g. time required to make physical movements as well as for regeneration). From a digitalization perspective, this means that while data for example can be transferred at the speed of light, it cannot necessarily be generated quicker by the organizational actors or the customers/citizens they serve. Moreover, while some services can be accelerated through technology use, other areas, e.g., education and care for the elderly, cannot be significantly increased in tempo due to characteristics of the human body. The seasons and days also cannot be accelerated, but seasonal effects can be manipulated by digital technologies, e.g., by directing the attention of both customers and employees to the advent of Christmas earlier and earlier as well as by packing more and more work activities into a 24-hour day.
Second, deceleration of work can happen at synchronization points where different speeds of work encounter each other and where individuals with different work schedules need to communicate in real time. On a small scale, this can lead to waiting times, perhaps even many times a day, which might in turn erode expected timesavings. Another aspect of this is that society and organizational work is becoming increasingly deroutinized, among other things because of the affordances of digital technologies, which means that it is increasingly difficult and time-consuming to schedule and synchronize social work practices, e.g., videoconferences and other types of online meetings. Thus, even though digital technologies that facilitate online communication might reduce the time needed for transportation, the timesaving is not a net reduction as time consumption for coordination and synchronization is likely to increase. On a large scale, desynchronization, for example between different departments or global divisions that use different types of technologies, can create massive slowdowns when complicated chains of work fall so far out of step that blockages occur.
Third, despite that society in general is become temporally deroutinized, with for example flexible workhours, remote work and globally distributed teams, many socially dominant and culturally taken-for-granted time structures still exist in most organizations. If unexamined, these structures are treated as normative expectations and organizational actors are likely to adopt and use digital technologies in accordance with these time structures rather than take advantage of the acceleration potential that the technology could offer if the dominant time structures were changed. For example, in the Danish university system the dominant time structure is to conceptualize and schedule all teaching related activities in semesters, with lectures and project work during the semester and exams at the end of each the semester. So far, implementation and use of digital technologies, such as learning

management systems and digital exams systems, have primarily been adapted to this existing way of working. Thus, the potential of the systems to run different types of more time intense and/or digitally supported courses and to facilitate a variety of exam forms at different points in time have not been taken into account. It is only just now after these systems have been in use for several years that the semester-oriented way of working is being questioned - among other things due to student demand for summer courses, budget pressure, and political and management interest in the economic potential of digitally supported education - that a period of experimentation and exploration has commenced at most universities. The example indicates that despite that most digital technologies have the potential to accelerate activities, the dominant time structures may prevent organizations from envisioning how the technology can be deployed to ensure more efficient as well as more creative and novel uses of time.

In addition to the three abovementioned deceleration mechanisms, which can be characterized as natural or unintended limits to speed, some organizations actively choose to decelerate the pace of work. This can be for ideological reasons, for example inspired by movements such as slow living, slow food, etc. or publications about 'Reversing the cult of speed in higher education' (Holdsworth, 2017) and 'The slow professor: Challenging the culture of speed in the academy' (Berg & Seeber, 2016). This can lead to communication policies that ensure that people do not feel obligated to check their email or answer work related phone calls outside of the institutionalized work hours. Intentional deceleration, such as planned breaks in the flow of activity, silent periods at the workplace and retreats, can also be used to facilitate regeneration that allows for speed afterwards. This emphasizes the dialectics between speeding up and slowing down, where organizations and organizational actors on the one hand, aim to keep up and speed up through dynamic capabilities (Teece et al., 1997), digital technologies and major transformations. While on the other hand, they try to resist the pressure to do everything quickly and instead want to choose when to be slow and when to be fast.

In summary, for the abovementioned reasons, digital technologies are as likely to have little overall effect or to decrease the pace of certain aspects of work (particularly work that requires coordination and synchronization), as they are to accelerate work.

A nuanced vocabulary for understanding the pace of work

In this section, we summarize the abovementioned insights about acceleration and deceleration mechanisms into a nuanced vocabulary for understanding how digital technologies can influence the pace of work and the use of time in organizations.

- Digital technologies can accelerate the speed of work in objective time, but only if organizational actors use them to perform activities faster and with fewer breaks in the flow of activities. This means that digital technologies can have a huge impact or little effect on the pace of work, depending on how the particular organization uses a given technology.
- Organizational actors often use digital technologies to communicate faster and more frequently, thereby significantly increasing the pace of work, because of unintentional shifts in collective values, norms and practices with regard to availability and responds times.
- Organizational actors often do not notice digitally induced timesavings, because the freed up time quickly is replaced with other activities or expectations of increased/improved output.
- Digital technologies can create new possibilities of action. However, organizations often have to invest substantial time and human resources to turn the potential into realized outcomes.
- Organizational actors experience natural limits to the pace of work due to aspects of the human body and calendar and clock time.
- Organizational actors are likely to spend increased amounts of time to coordinate and synchronize their joint activities the more the potential of digital technologies to deroutinize work is used.
- Organizational actors are likely to adopt and use digital technologies in accordance with the socially dominant time structures that prevail in the particular organization, which means that the technology can have huge impact if it is well aligned with these structures or limited effect if it is not.
- Some organizations actively choose to decelerate the pace of work to reduce stress and harriedness caused by shifts in collective expectations and norms or to facilitate regeneration that allow for speed afterwards.

From a 'classical' theory development perspective (Sutton & Staw, 1995), these statements can be seen as a first step towards developing propositions that can be used to test theory, for example with regard to the relational strength between constructs, at a later stage in the theory building process. However, as our research is rooted in a social constructivist perspective, we are more concerned with formulating questions that can generate dialogue, interesting answers and new ways of acting than with theory testing (Gergen, 1985; Hansen & Madsen, 2019).

A conceptual framework for empirical inquiry

So far, we have addresses digital technologies in a general way. However, as mentioned, the main argument in this paper is that whether digital technologies accelerate the pace of work or not depends on how they are used - as they do not come with an inherent temporal logic (Hörning et al., 1999; Rosa, 2013; Wajcman, 2015). Moreover, as technology use always is contextual, what really matters is how a given technology is used by the particular organization. Therefore, we operationalize the abovementioned insights as eight parameters with belonging questions, which we believe organizational actors would benefit from discussing when they consider whether to adopt a particular digital technology and how to realize the acceleration potential it might be able to offer. The questions allow for a dialogue that focuses on how to ensure temporal outcomes, shift temporal norms, and notice and take measures to overcome speed limits.

Parameters	**Inquiry and intervention**
Ensuring temporal outcomes	
Acceleration in objective time	How will the digital technology be able to acceleration the pace of work in objective time? How can we make sure that the acceleration potential is realized?
Saving time	How can the digital technology help us save time? How can we ensure that the freed up time is replaced with deliberately chosen, value creating activities?
New possibilities of action	Which new opportunities and possibilities of action might the digital technology be able to create? What will it take (time, human resources, other investments) to take advantage of these opportunities?
Shifting temporal norms	
Collective expectations and norms	How might the digital technology influence the collective expectations and norms with regard to how fast and frequent, e.g., communication takes place? How can we monitor shifts in norms and practices and intervene if necessary?
Socially dominant time structures	What are the socially dominant time structures that currently shape how we plan and use our time? Do we have to structure the way we use our time in a (completely) different way to realize the potential of the technology, and if so how?
Addressing speed limits	
Temporal coordination costs	How might the digital technology increase the time needed to coordinate and synchronize joint activities? What can we do to facilitate coordination of joint activities in a less temporally costly way?
Natural limits to speed	What are the natural limits to speed with regard to this digital technology? Do we have to adjust our expectations in accordance with these speed limits?
Intentional deceleration of speed	Do we need to take measures that can counter the negative subjective phenomena that the digital technology might create (e.g., increased time pressure, stress)? If so, what kind of (regenerative) measures are needed?

Table 1: Eight parameters for empirical inquiry and intervention

From a research perspective, the questions in Table 1 can be used to engage with organizations (Van de Ven, 2007) to collaboratively create new understandings of the temporal aspects of IT use and IT

benefits realization as well as to theorize more generally about the complex relationship between time, technology and the pace of work.

Conclusion

This paper makes several contributions. First, we introduce Hartmut Rosa's theoretical ideas about the acceleration of society and modern life to the literature base concerned with IT-enabled organizational change, and more specifically to the literature that addresses the digitalization of work. Second, we combine extant literature about the concept of time and time-driven change with Rosa's acceleration and deceleration mechanisms into a nuanced vocabulary for understanding how digital technologies influence the pace of work. Third, we operationalize this vocabulary as a conceptual framework that consists of eight parameters with belonging questions, structured around a focus on how to ensure temporal outcomes, shift temporal norms as well as how to take different types of limits to speed into account. The framework allows both organizational researchers and practitioners to inquire and intervene into an organization's established time norms, values and practices in order to ensure that a particular digital technology influences the pace of work in a planned, organizationally value creating and individually, positive way. The framework also paves the way for further conceptual research into the complex relationship between time, technology and the speed of work.

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